IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Glen VAN DATTA et al.
Serial No.	:	10/700,798
Filed	:	November 3, 2003
For	:	PEER-TO-PEER RELAY NETWORK
Examiner	:	Ramy M. Osman
Art Unit	:	2457
Confirmation No.:		6261

745 Fifth Avenue
New York, NY 10151

CERTIFICATE OF ELECTRONIC FILING

I hereby certify that this correspondence is being transmitted via Electronic Filing Services on March 9, 2009.

Patricia A. Dubyne
(Name of person signing transmittal)

Patricia A. Dubyne
Signature

March 9, 2009
Date of Signature

DECLARATION UNDER 37 CFR 1.131

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

We, Anthony Mai and Glen Van Datta, hereby declare as follows:

1. We are the joint inventors of the above-noted United States Patent Application 10/700,798, filed in the United States Patent and Trademark Office on November 3, 2003, and with a claim of priority under 35 U.S.C. 119(e) to Provisional Application 60/513,098, filed October 20, 2003.

2. We hereby declare we conceived and reduced to practice the invention defined by claim 24 ("the invention") of the above-noted application prior to April 9, 2002, the United States filing date of United States Patent 7,174,382 issued to Ramanathan et al. ("Ramanathan"), as demonstrated in the exhibits attached to this Declaration. Our earlier conception and reduction to practice of my claimed invention is evidenced by the following statements:

3. Prior to April 9, 2002, we conceived of the invention of the present application as evidenced by Exhibit A, titled "Multi-Channel Multi-Party Audio Streaming Protocol" ("Protocol"), which was attached to an e-mail that Anthony Mai sent to Glen Van Datta prior to April 9, 2002. Language in the e-mail portion of Exhibit A has been redacted to preserve attorney-client privileged information. Specific nomenclature in the Protocol has been redacted to preserve confidential information.

4. The Protocol discloses the elements recited in claim 24. In particular, the Protocol describes the method of joining (adding) a peer system to a peer-to-peer (P2P) system and a method of establishing a P2P network.

5. Our invention was reduced to practice in a computer implementation as evidenced by the attached Exhibits B and C, which perform the functions recited by the elements recited in claim 14. These exhibits are source code that is proprietary to the assignee of the present invention; and such source code has been redacted to preserve the confidentiality of such source code.

6. Exhibit B is computer source code created prior to April 9, 2002. Exhibit B constructs and sends out communications packages, as well as receives and processes incoming communication packages, pertaining to the forming and maintenance of the relay grid. Exhibit B

describes the data packages that the relay grid tries to relay. Portions of Exhibit B have been redacted to preserve confidential information.

7. Exhibit C is computer source code created prior to April 9, 2002. Exhibit C manages the features in Exhibit B as well as manages the high level application requests. Exhibit C generates and processes the message packages that are used to implement the invention. Exhibit C also accepts incoming and outgoing audio data streams and processes the data streams in proper data packages Exhibit C utilizes and manages Exhibit B to allow each client to interact with each other using pre-defined message packages in order to connect to each other and form the relay grid described in the invention. Function calls from Exhibit C are reproduced in Exhibits C1-C8 and are explained in more detail herein as necessary. Portions of Exhibits C and C1-C8 have been redacted to preserve confidential information.

8. Exhibit D includes computer "screen captures" resulting from execution of the source code and algorithms of Exhibit B and Exhibit C in a computer environment. The resulting "screen captures" of Exhibit D were successful and repeatable. Exhibit D is evidence that our invention was reduced to practice. Portions of Exhibit D have been redacted to preserve confidential information.

9. The "screen captures" of Exhibit D were prepared recently using the source code and algorithms of Exhibit B and Exhibit C running on a computer test platform available during the testing of the present invention. Such testing was performed prior to April 9, 2002 to determine the source code was successful, operable, and repeatable.

10. The function call on page 10 of Exhibit C and reproduced as Exhibit C1 causes the code to start the process to construct a relay grid, which implements the element "adding a peer system to a peer-to-peer relay network," recited in claim 24.

11. The function call on page 11 of Exhibit C and reproduced as Exhibit C2 causes the code to process any incoming network package and decide further processing depending on the package, which implements "opening a connection between a server and a joining peer system," recited in claim 24.

12. The function call on page 24 of Exhibit C and reproduced as Exhibit C3; the function call on page 25 of Exhibit C and reproduced as Exhibit C4; the function call on page 26 of Exhibit C and reproduced as Exhibit C5; and the function call on page 27 of Exhibit C and reproduced as Exhibit C6; cause the code to allow top application layer code to obtain information about existing channels (relay grid) and clients who have joined in each channel, which implements "providing grid information to said joining peer system indicating one or more established peer-to-peer relay networks," recited in claim 24.

13. The function call on page 22 of Exhibit C and reproduced as Exhibit C7 causes the code to cause the local client to join a relay grid, which implements "receiving a grid selection from said joining peer system indicating a selected peer-to-peer relay network, wherein said selected peer-to-peer relay network has one or more member peer systems," recited in claim 24.

14. The function call on page 27 of Exhibit C and reproduced as Exhibit C8 causes the code to provide bookkeeping of the network address of individual member peer systems to the underlying implementation of the peer relay system, which implements "providing network addresses of each of said one or more member peer systems to said joining peer system," recited in claim 24.

15. The function call on page 22 of Exhibit C and reproduced as Exhibit C7 causes the code to enable a local client to join a relay grid, which implements "receiving a connection

update from said joining peer system indicating to which member peer systems said joining peer system is connected," recited in claim 24.

16. The function call on page 22 of Exhibit C and reproduced as Exhibit C7 causes the code to start a sequence of actions and message exchanges, which implements "wherein each member peer system is connected to a number of other member peer systems that is less than or equal to a connection limit and each member peer system stores a set of one or more relay rules for relaying data to the other member peer systems connected to that member peer system," recited in claim 24.

17. As evidenced by attached Exhibits A through C, every element of my claimed invention was reduced to practice prior to April 9, 2002.

We each hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signature of Declarant

Mar. 6th, 2009
Date

Anthony Mai
Print or Typed name of Declarant

Signature of Declarant

Date

Glen Van Datta
Print or Typed name of Declarant

update from said joining peer system indicating to which member peer systems said joining peer system is connected," recited in claim 24.

16. The function call on page 22 of Exhibit C and reproduced as Exhibit C7 causes the code to start a sequence of actions and message exchanges, which implements "wherein each member peer system is connected to a number of other member peer systems that is less than or equal to a connection limit and each member peer system stores a set of one or more relay rules for relaying data to the other member peer systems connected to that member peer system," recited in claim 24.

17. As evidenced by attached Exhibits A through C, every element of my claimed invention was reduced to practice prior to April 9, 2002.

We each hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signature of Declarant Date

Anthony Mai
Print or Typed name of Declarant

Signature of Declarant 3/5/09
Date

Glen Van Datta
Print or Typed name of Declarant

EXHIBIT A

From: [redacted]
Sent:
To: [redacted]
Subject: [redacted]

Attachments: [redacted]

----- [redacted] -----

[redacted]

To

[redacted]

cc

[redacted]

Subject

[redacted]

[redacted]

Anthony Mai
Sony Computer Entertainment America
http://www.scea.com
----- [redacted] -----

Anthony Mai/SDPD/SCEA

[redacted]

To

Glen Van
Datta/SDPD/SCEA

cc

Subject
The document

Glen:
Here is the doc file attackment.

Anthony Mai
Sony Computer Entertainment America
http://www.scea.com (See attached file: AudioProtocol.doc)

Multi-Channel Multi-Party Audio Streaming Protocol

Introduction

Audio streaming in the online game scenery is different from conventional VoIP application in a number of ways. First, conventional VoIP system has only one data source. It may have one data target, like in the case of internet telephone, or it may have one server and multiple data targets, like in the case of internet radio or other broadcast steaming.

In the online game scenery, there could be multiple data sources (each player in a game may speak), and there could also be multiple data targets (each player in a game may also listen.) And there may not even be a central server to receive and re-distribute all the audio data.

Due to network bandwidth limitation, a multi-channel Multi-party audio streaming protocol must be designed to allow multiple players to talk with each other over the network.

Assumption of the protocol:

The following assumptions will be made:

1. There will always be one session master among all players in a game. When the session master quits the game, it will be detected when the session master is absent and a new session master will be selected from the remaining players.

2. The session master maintains a list of all the available audio channels, or audio rooms. And it gives authorization of each player in each room to speak. Each individual player also keeps a copy of the audio room list.

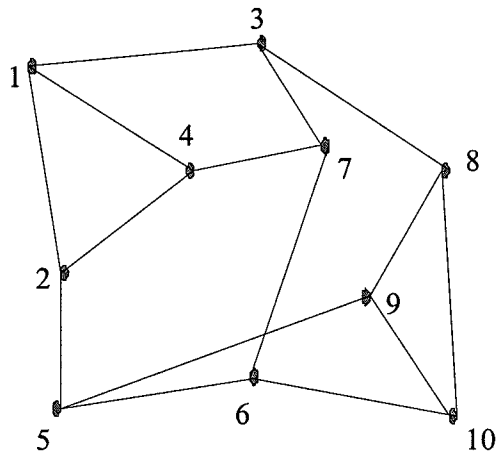
3. The network grid. Each [redacted] will be connected to no more than 3 other [redacted] directly. Any data initially received by a [redacted] from one of the 3 it connects to will be forwarded to the two other [redacted]. Repeated data is not forwarded. By this mechanism, data from any one [redacted] can eventually spread to all [redacted] in the grid.

The network grid

The grid limits each [redacted] network bandwidth requirement (since it only needs to communicate with 3 other [redacted]) while allowing data from any single [redacted] to quickly spread to every other [redacted] in the grid, using UDP sockets.

There will be a network grid for the channel 0, or room #0. All [redacted] are connected to this grid. This will be used for none-audio control messages.

There will be one separate network grid for each audio room. Each [redacted] can optionally join a specific audio room. But each [redacted] can join no more than one audio room at a time.



Each [redacted] is connected to 3 other [redacted], forming a grid

Within each audio room grid, there can be only one player speaking at a time. Any [redacted] wishing to speak should wait until the speaker has finished or paused. If multiple players try to speak, the collision will be detected and every one stops, and after a random time interval attempts to speak again.

Establishment of the audio room network grid

Any [redacted] can create an audio room and this event is broadcast to every one in the game, through the channel 0 grid. The [redacted] that created the audio room becomes the first node of the network grid. It will notice that it has three arms of connection, none occupied yet.

Any [redacted] wishing to join an audio room broadcast a message through the channel 0 grid. Every [redacted] within the grid then sends the new [redacted] a welcome message, specifying whether they have a free arm of connection available or not.

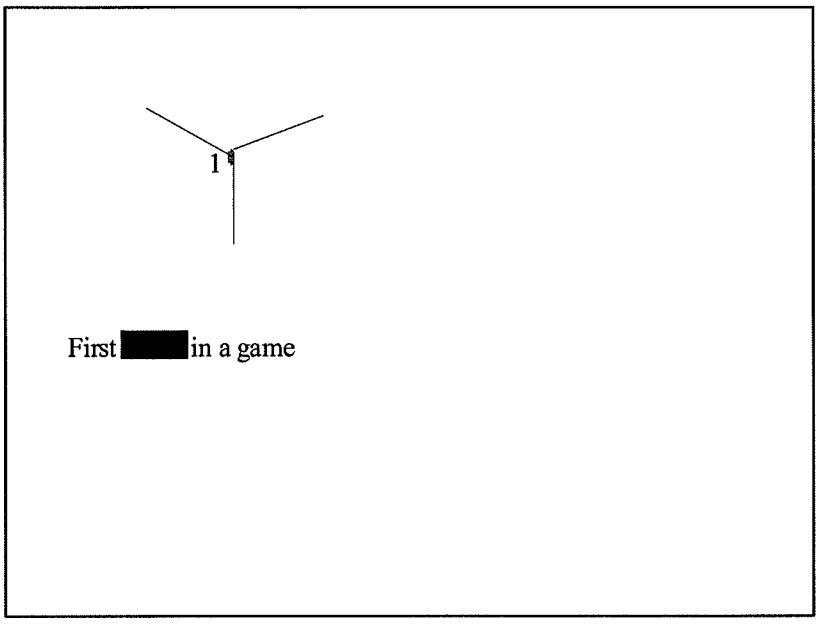
The new [redacted] first takes offers of connection from existing [redacted] who has a free arm of connection. And then request connection with the very first [redacted] who greeted it with an acknowledgement that it has no spare connection. Upon such request, the existing [redacted] breaks one of its connections and connects with the new [redacted].

Any [redacted] with a broken down connection will then announce the availability of connection on channel 0. The [redacted] who also have free connection arm will respond to such announcements, and so the two establishes a connection.

Establishment of the channel 0 grid

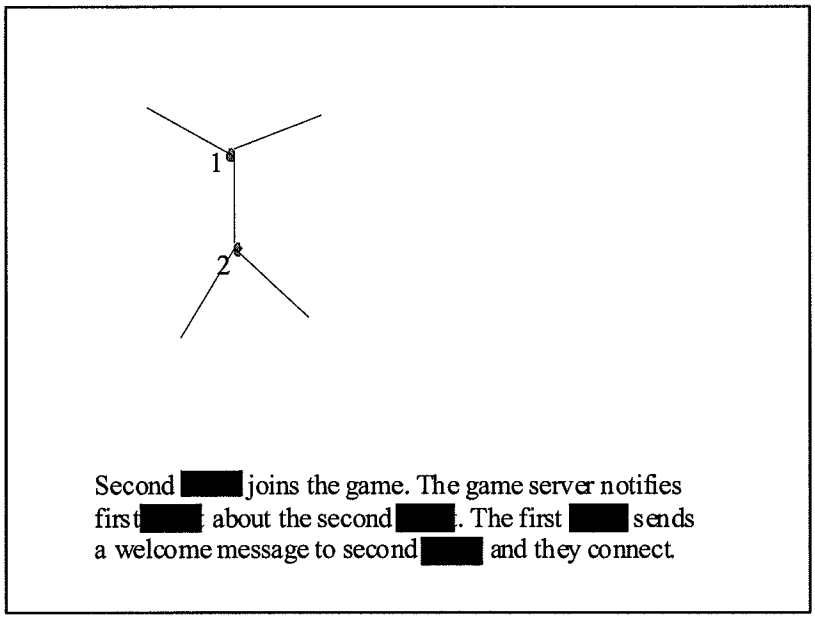
Channel 0 grid is the network grid that every [redacted] is connected to. So it is important that when each [redacted] joins the game, it connects to the channel 0 grid properly.

1. First [redacted]
   When the first [redacted] creates a new game session, there are no other [redacted]. So all three grid connections of the first [redacted] is available.



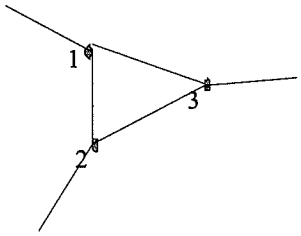
First [redacted] in a game

Second [redacted]



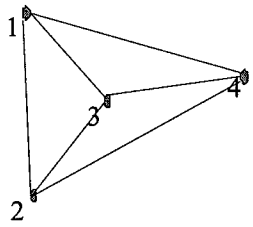
Second [redacted] joins the game. The game server notifies first [redacted] about the second [redacted]. The first [redacted] sends a welcome message to second [redacted] and they connect.

Third [redacted] joins



Third [redacted] joins the game. The game server notifies first 2 [redacted] about the third [redacted]. The first 2 [redacted] send a welcome message to the third and they connect.

Fourth [redacted] joins



Fourth [redacted] joins the game. The game server notifies existing [redacted] about the third [redacted]. Each existing [redacted] sends a welcome message to the new [redacted] and they connect.

The new [redacted] joining protocol:

1. The game server sends the new [redacted] info to all existing [redacted] within a game.
2. Each existing [redacted] sends a welcome UDP message to the new [redacted], indicating whether it has any spare connection arm available.
3. The new [redacted] respond to the first 3 (or less) welcome messages that indicated the availability of connection arms, by sending a connection request message to the [redacted] directly.
4. The [redacted] that receives the connection request message sends a connection accepted message back. And the connection is established.
5. If the new [redacted] still has 2 or more connection arms unused, it further sends a connection request message to the first existing [redacted] who sent a welcome message with no available connection arm.
6. Upon connection requests from the new [redacted], an existing [redacted] would randomly break one of the connection arms, and then sends a connection accepted message back to the new [redacted].

Maintaining the grid

[redacted] could drop out of the network grid unexpectedly, without notice. So it is important that the grid can recover from lost connection.

1. Each pair of connected [redacted] will send a ping to each other periodically. Receiving a ping indicates that a connection is still alive.
2. If [redacted] A is informed of disconnection from another [redacted], or if a ping has not been received for a certain time period, the [redacted] marks that connection arm as free, and send out a connection arm available message, on channel 0.
3. When [redacted] B receives a connection arm available message, and it has a free connection arm, it responds by sending a connection request message.
4. When [redacted] A receives a connection request message, it sends a connection accepted message back. And the two is connected.

Dropping out of the grid

If a [redacted] intend to quit the game, it should post a message to all [redacted] it connects to indicating that it is quitting.

When a ping hasn't been received for certain time interval from a connected [redacted], one has to assume the connection no longer exist, and should then broadcast through the existing arms of connection that it has a free arm of connection available. Any other [redacted] who also has a free arm of connection will then respond and so the two can connect.

Transferring data within the grid

The network grid is established to allow all [redacted] within the grid to share information with minimal network load for each individual [redacted].

A sender ID and a sequence number uniquely identifies each package of the data, so when a [redacted] receives the package, it knows whether it has already received the package or not. If the [redacted] hasn't received the package before, it will forward the package to the other two [redacted] it connects to, except for the one that it just received the package from. If a [redacted] receives the same package again, it simply discard it, preventing the package from further circulation within the grid.

This way, there will be no repeated packages received, and chances of lost package will be extremely low, since each [redacted] is connected to three other [redacted] and the packaged could be forwarded to the [redacted] via different paths. This way, the network grid concept addresses two of the common problems related to UDP sockets: duplicated or lost packages.

Transferring audio data within the grid

Each package of audio data will contain one or more frames of audio data. The package header will indicate the compression scheme, frame sequence number, frame count, sender of the package, and whether it is a voiced or silence frame.

When each [redacted] within the grid receives the audio data package, forward the package according to the network grid protocol. At the same time it tries to sequence the audio data in proper order, decode them, and send the data to audio output device.

Each [redacted] decide whether it can speak or not according to the following rules:

1. If no voice package was received within certain time period (like 1-2 seconds), it can start to speak.
2. If one or several silence voice packages are received, that means the previous speaker has stopped speaking, so the [redacted] can start to speak.
3. If after a [redacted] starts to speak, it receives a voice package from a different [redacted], a collision has occurred. Under such circumstance the [redacted] should immediately stop speaking, and wait for the next opportunity to speak.
4. When the [redacted] can start to speak, there will be some indication on the computer screen hinting that the human player can start to speak. The player may or may not speak. If the player speaks, it will be automatically detected and the audio streaming engine will begin pumping audio data to the network grid.
5. When a [redacted] speaks, silence will be automatically detected and a silence package will be send out, allowing other [redacted] to speak, while the local [redacted] will wait for next opportunity to speak.
6. If a [redacted] speaks for too long (like 1 minutes), it will be forcefully stopped, allowing other [redacted] an opportunity to start speaking.

EXHIBIT B

```
/*****************************************************************************
**
*
* Copyright (c) [redacted] SCEA. All Rights Reserved.
*
* This software contains the valuable trade secrets of SCEA.  The
* software is protected under copyright laws as an unpublished work of
* SCEA.  Notice is for informational purposes only and does not imply
* publication.  The user of this software may make copies of the software
* for use with parts manufactured by SCEA or under license from
* SCEA and for no other use.
*
*****************************************************************************
*/

/*****************************************************************************
**
*
*  [redacted]
*
*  Description:       The implementation of the network grid class.
*
*
*  Programmers:     Anthony Mai (am) anthony_mai@playstation.sony.com
*
*  [redacted]
*
*  [redacted]
*
*****************************************************************************
*/

#if [redacted]IN32)
#inc[redacted]b.h>
#inc[redacted]y.h>
#end[redacted]32)

#in[redacted]g.h>
#in[redacted]o.h"
#in[redacted]l.h"
#in[redacted]d.h"
#in[redacted]o.h"
#in[redacted]e.h"
#in[redacted]r.h"
#in[redacted]f.h"

#if[redacted]32)
sta[redacted]d();
#e[redacted]f

#de[redacted]nds
#de[redacted]nds
#de[redacted] of
s[redacted]h.
```

```
#if                                    2)
sta              d()
{
      sta                    89;

      las                              011;

      ret                              ff);
}
#e   f

/*****************************************************************************
**
* Function:          
*
* Description:    Invalidate a specific connection by setting the status flag
*                to STATUS_INVALID and nollify the IP and Port.
*
* Returns:        
*****************************************************************************
*/
vo                                  te()
{
    sta                            LID;
    IP           = 0;
    Por          = 0;
    las          = 0;
    nPi          = 0;
}


/*****************************************************************************
**
* Function:          
*
* Description:      class constructor
*
* Returns:    
*****************************************************************************
*/
CG          id
(
    CA                ent,
    RT                nel
) :
    m_p               nt),
    m_C               el),
    m_p          L),
    m_n          L),
    m_n          (0),
    m_L                  e(0),
    m_b              (0),
    m_C             (0),
    m_C              (0),
    m_L              (0)
{
    RT                                      s();
```

```
    m_N[redacted]00;
    m_L[redacted]ime;
    mem[redacted]on));
    for[redacted]++)
    {
        m_C[redacted]ime;
    }
    mem[redacted]ng));
}

/*****************************************************************************
**
* Function:       [redacted]
*
* Description:    [redacted] class destructor
*
* Returns:        [redacted]
*****************************************************************************
*/
CG[redacted]id()
{
}

/*****************************************************************************
**
* Function:       [redacted]
*
* Description:    Return a sequence number for none-audio data packages. Do OT
*                 use this one if it is an audio data package.
*
* Returns:        [redacted]
*****************************************************************************
*/
RT[redacted]ce()
{
    ret[redacted]++;
}

/*****************************************************************************
**
* Function:       [redacted]e
*
* Description:    Send a package to all [redacted] this grid connects to, except for
*                 the originator of the package.
*
* Returns:        [redacted]
*****************************************************************************
*/
AUD[redacted]ge
(
    RT_[redacted]IP,
    RT_[redacted]rt,
    AUD[redacted]dr,
```

```
    con                    er,
    RT_                    ze
)
{
    RT_                i;
    RT_                    ze;
    AUD                    OR;
    RT_                    ce;
    RT_                    ZE];

    // Fi                  ge.
    mem                    dr));
    nSi                dr);
    swi                pe)
    {
    c                  M:
    c                  M:
    c                  0:
        // We                                          ges.
        nAu                                          ();
        mem                                          e));
        nS                 e);
        br  ;
    de    :
        b   k;
    }

    mem                    ize);
    nSi            ze;

    for                    ++)
    {
        if (                                         &&
            ((m_                ) ||
            (m_C                t)) )
        {
            if                 dTo(
                tm     f,
                nS     ,
                m_C            IP,
                m_C            ort
                ) )
            {
                ret            ROR;
            }
            e
            {
                re             IC;
                b   k;
            }
        }
    }

    re      et;
}
```

```
/*****************************************************************************
**
* Function:         [redacted]
*
* Description:      Set the standard package header for usage.
*
* Returns:          [redacted]
*****************************************************************************
*/
voi[redacted]er
(
    AUD[redacted]r,
    RT_[redacted]e,
    RT_[redacted]n
)
{
    // We [redacted] bit.
    pHd[redacted]TOR);
    pHd[redacted]Len;
    pHd[redacted]();
    pHd[redacted]nel;
    pHd[redacted]lIP;
    pHd[redacted]rt;
}


/*****************************************************************************
**
* Function:         [redacted]
*
* Description:      The update function. When called, time controled processings
*                   are done at appropriate times.
*
* Returns:          [redacted]e.
*****************************************************************************
*/
AUD[redacted]e()
{
    RT_[redacted] i;
    RT_[redacted]Ms();

    if [redacted]ime) >
JO[redacted]T))
    {
        for[redacted]i++)
        {
            if [redacted]LID)
            {
                b[redacted]k;
            }
        }
        if (i [redacted]ONS)
        {
            AUD[redacted]Hdr;
            CLI[redacted]st;

            con[redacted]el;
```

```
            con                                                    lIP;
            con                                                                ort;

            m_C                                                        NG;
            m_C                                                            tIP;
            m_C                                                            ort;
            m_C                                                            ;
            m_C                                    0;

            Set          r(
                &se          dr,
                MSG                CT,
                siz              est)
                );

            // Do                        ow?
            //se                                                              nel;

            m_p                      ge(
                m_L                        IP,
                m_L                        ort,
                &se          dr,
                &co          st,
                siz                st)
                );
        }
        m_L              e = 0;
        mem                                                              ng));
}

for                                    i++)
{
    if (                                                          ED)
    {
        if (                                                                me))
            < PI                AL )
        {
            // We                                    OK.
        }
        el                                         < 3)
        {
            // Let                                                                live
            AUD                        dr;

            m_C                                                    ime;

            Set                                              0);
            m_p                      ge(
                m_C                .IP,
                m_C                rt,
                &se          Hdr,
                N    ,
                );
        }
        e
        {
```

```
                // The                                                    the
g   d.
                AUD                    dr;
                CLI                    it;

                Set                                    IT,
si              it));
                // We                                                    ere.
                sen                                    OR;
                sen                                      IP;
                sen                                                    ort;

                cli                                    it);
                cli                                    IP;
                cli                                                    rt;

                Sen     ge(
                    cli             IP,
                    cli             rt,
                    &se       dr,
                    &cl       it,
                    siz             it)
                    );

                if (m_          0)
                {
                    Re          r(
                        cli             IP,
                        cli             ort
                        );
                }

                m_p             r(
                    cli             IP,
                    cli             ort
                    );
            }
        }
    }

    ret             OR;
}


/*****************************************************************************
**
* Function:         
*
* Description:    Process the audio data package. The data should be send to
*                 sequence controler and then be fetched by the application.
*
* Returns:        
*****************************************************************************
*/
AUD                             ack
(
    AUD             Hdr,
```

```
    RT_                 mIP,
    RT_                 rt,
    con                 fer,
    RT_                 ze
)
{
    RT_       i;
    RT_                 nce;
    RT_                                 eMs();

    if                              SM)
    { // We                        GSM
        ret             RIC;
    }

    // Fir                  age
    for                         i++)
    {
        if (m                                   TED)
        {
            if                                  &&
                (m_C                        ort) )
            {
                // The                                      is
e.
                m_C                                 ime;
                m_C                         = 0;
            }
            els                                 IP) &&
                (m_                                 rt) )
            {
                // We                                       tor
            }
            e  e
            {
                m_p             To(
                    pB      r,
                    cb      e,
                    m_C             .IP,
                    m_C             rt
                    );
            }
        }
    }

    pBu             Hdr);
    cbS             Hdr);

    mem                                         ce));
    pBu                         nce);
    cbS                         nce);

    m_p                             ce(
        pHd         IP,
        pHd         rt,
        nAu         ce,
        pBu     r,
```

```
        cb[redacted]e
        );

    m_La[redacted]me;
    if [redacted] 0)
    {
        m_C[redacted]rIP;
        m_C[redacted]ort;
    }
    e[redacted]
    {
        m_C[redacted]= 0;
        m_C[redacted]t = 0;
    }

    ret[redacted]OR;
}


/*****************************************************************************
**
* Function:        [redacted]k
*
* Description:    Process none-audio data control packages. And respond accordingly.
*
* Returns:        [redacted]e.
*****************************************************************************
*/
AUD[redacted]ack
(
    AUD[redacted]dr,
    RT_[redacted]IP,
    RT_[redacted]rt,
    con[redacted]fer,
    RT_[redacted]ize
)
{
    int[redacted]i;
    AUD[redacted]dr;
    AUD[redacted]ROR;
    RT_[redacted]Ms();
    RT_[redacted]lse;
    un[redacted]n {
        con[redacted]p;
        con[redacted]Join;
        con[redacted]uest;
        con[redacted]nnel;
        con[redacted]ing;
        con[redacted]ept;
        con[redacted]ect;
        con[redacted]ect;
        con[redacted]ect;
        con[redacted]Info;
        con[redacted]nfo;
        con[redacted]nel;
        con[redacted]nel;
        con[redacted]uit;
```

```
};

p =[redacted]HDR));
// Fir[redacted] do,
// for[redacted]ngs.

swi[redacted]ype)
{
cas[redacted]NE:
cas[redacted]NG:
cas[redacted]NG:
    bF[redacted]se;
    b[redacted]k;
cas[redacted]AT:
cas[redacted]IN:
    bF[redacted]rue;
    br[redacted];
cas[redacted]ECT:
    bF[redacted]ue;
    br[redacted];
cas[redacted]NG:
    bF[redacted]se;
    b[redacted]k;
cas[redacted]NEL:
    bF[redacted]rue;
    br[redacted];
c[redacted]O:
    b[redacted]e;
    b[redacted];
cas[redacted]NEL:
cas[redacted]NEL:
cas[redacted]IT:
    bF[redacted]rue;
de[redacted]t:
    br[redacted];
}

for [redacted] i++)
{
    if [redacted]TED)
    {
        if [redacted] &&
            (m_C[redacted]rt) )
        {
            // The[redacted]y is
a[redacted]e.
            m_C[redacted]ime;
            m_C[redacted]= 0;
        }
        els[redacted]) &&
            (m_C[redacted]ort) )
        {
            // We d[redacted]tor
        }
        els[redacted]sg)
        {
            m_p[redacted]dTo(
```

```
                pB[redacted]r,
                cb[redacted],
                m_C[redacted]IP,
                m_C[redacted]rt
                );
        }
    }
}

// Now[redacted]sage.
swi[redacted]pe)
{
cas[redacted]NE:
    br[redacted]

cas[redacted]NG:
    {
        Set[redacted], 0);

        m_p[redacted]ge(
            fr[redacted]P,
            fr[redacted]rt,
            &s[redacted]dr,
            NU[redacted],
            0
            );
    }
    br[redacted];

cas[redacted]G:
    br[redacted];

cas[redacted]AT:
    b[redacted]k;

cas[redacted]IN:
    {
        CPl[redacted]er;

        pNe[redacted]er(
            pHd[redacted]IP,
            pHd[redacted]rt,
            m_C[redacted]l
            );
        Add[redacted]r);
        ret[redacted]g(
            p[redacted]d[redacted]IP,
            pHd[redacted]ort,
            t[redacted]
            );
    }
    b[redacted]k;

cas[redacted]CT:
    {
        ret[redacted]ng(
            pHd[redacted]IP,
```

```
                pHd[redacted]rt,
                fa[redacted]
                );
        }
        b[redacted]k;

cas[redacted]NG:
        {
            CPl[redacted]er;
            CLI[redacted]st;

            pPl[redacted]er(
                pHd[redacted]IP,
                pHd[redacted]rt,
                pGr[redacted]el
                );

            if (m[redacted] 0)
            {
                Add[redacted]r);

                if [redacted] 0)
                {
                    CGr[redacted]el);
                    if [redacted]LL)
                    {
                        REQ[redacted]fo;

                        // Add[redacted]nel
                        pGr[redacted]el);

                        // We [redacted]nel
                        req[redacted]el;

                        Set[redacted]r(
                            &s[redacted]dr,
                            MSG[redacted]FO,
                            siz[redacted]fo)
                            );

                        m_p[redacted]ge(
                            pHd[redacted]IP,
                            pHd[redacted]rt,
                            &se[redacted]dr,
                            &re[redacted]fo,
                            siz[redacted]fo)
                            );
                    }
                    pGr[redacted]er);
                }
            }

            for [redacted]++)
            {
                if ((m_C[redacted]ED) &&
                    (m_C[redacted]P) &&
                    (m_C[redacted]t) )
```

```
            {
                b[redacted]k;
            }
        }
        if ([redacted]NS)
        {
            // We [redacted]nt
            br[redacted];
        }
        for [redacted]i++)
        {
            if (m_[redacted]ID)
            {
                br[redacted];
            }
        }
        if ([redacted]NS)
        { // We [redacted]dy
            br[redacted];
        }
        if ([redacted]s > 0)
        {
            con[redacted]nel;
            con[redacted]lIP;
            con[redacted]ort;

            m_C[redacted]NG;
            m_C[redacted]rIP;
            m_C[redacted]ort;
            m_C[redacted]me;
            m_C[redacted]= 0;

            Set[redacted]r(
                &se[redacted]dr,
                MSG[redacted]CT,
                siz[redacted]st)
                );

            m_p[redacted]ge(
                pHd[redacted]IP,
                pHd[redacted]rt,
                &se[redacted]dr,
                &co[redacted]st,
                siz[redacted]st)
                );
        }
        e[redacted]
        {
            m_L[redacted]me;
            m_L[redacted]g;
        }
    }
    br[redacted];

cas[redacted]CT:
    {
        CLI[redacted]pt;
```

```
                for [redacted]++)
                {
                    if [redacted]ED)
                    {
                        // Fou[redacted]nch.
                        br[redacted];
                    }
                }

                if [redacted]NS)
                {
                    // If w[redacted]ted
                    CLI[redacted]ct;

                    i =[redacted]NS;
                    cli[redacted]el;
                    cli[redacted]IP;
                    cli[redacted]nt-
>m_[redacted]t;

                    Set[redacted]r(
                        &se[redacted]dr,
                        MSG[redacted]CT,
                        siz[redacted]ct)
                        );

                    m_[redacted]e(
                        m_[redacted]P,
                        m_[redacted]t,
                        &s[redacted]r,
                        &c[redacted]t,
                        si[redacted]t)
                        );

                    m_C[redacted]D;
                    m_C[redacted] 0;
                    m_C[redacted] 0;
                    m_C[redacted]e = 0;
                }

                m_C[redacted]IP;
                m_C[redacted]rt;
                m_C[redacted]ED;

                con[redacted]el;
                con[redacted]IP;
                con[redacted]rt;

                Se[redacted]Hdr,
                    MS[redacted]CT,
                    siz[redacted]pt)
                    );

                m_p[redacted]e(
                    pHd[redacted]IP,
                    pHd[redacted]rt,
```

```
                &se      dr,
                &co      pt,
                s z      pt)
                );
        }
        br  ;

    cas      CT:
        {
            for      ++)
            {
                if (      &&
                    (m_C      &&
                    (m_C      rt) )
                {
                    // Foun      nch.
                    br  ;
                }
            }

            if      ONS)
            {
                m_C      ED;
                m_C      ime;
                m_C      = 0;
            }
            e
            {
                // Tell      ion.
                CLI      ect;

                cli      nel;
                cli      lIP;
                cli      nt-
>m_L      t;

                Set      r(
                    &se      dr,
                    MSG      CT,
                    siz      ct)
                    );

                m_p      ge(
                    pHd      P,
                    pHd      t,
                    &se      dr,
                    &cl      ct,
                    siz      ect)
                    );
            }
        }
        br  ;

    cas      CT:
        // To      e.
        br  ;
```

```
cas[redacted]CT:
    {
        for [redacted]i++)
        {
            if ([redacted]) &&
                (m_C[redacted]ort) )
            {
                CLI[redacted]t;

                m_C[redacted]D;
                m_C[redacted] = 0;
                m_C[redacted] = 0;
                m_C[redacted] = 0;

                may[redacted]el;
                may[redacted]IP;
                may[redacted]nt-
>m_[redacted]t;

                Set[redacted]Hdr,
                    MSG[redacted]CT,
                    siz[redacted]ct)
                    );

                Sen[redacted]e(
                    pHd[redacted]P,
                    pHd[redacted]t,
                    &se[redacted]r,
                    &ma[redacted]ct,
                    siz[redacted]t)
                    );

                b[redacted]k;
            }
        }
    }
    b[redacted]k;

cas[redacted]EL:
    {
        CGr[redacted]nel);
        if [redacted]LL)
        {
            // Chann[redacted]it
        }
        e[redacted]
        {
            CPl[redacted]r;

            pPl[redacted]r(
                pHd[redacted]IP,
                pHd[redacted]rt,
                pCr[redacted]l
                );

            pGr[redacted]nel);
```

```
                    str[redacted]e,
siz[redacted]me));
                    pGr[redacted]x00;

                    pGr[redacted]er);
                }
            }
            b[redacted]k;

        cas[redacted]NFO:
            {
                CGr[redacted]nfo-
>nC[redacted]l);

                if [redacted]d)
                {
                    CHA[redacted]o;

                    cha[redacted]fo);
                    cha[redacted]el;
                    str[redacted](
                        cha[redacted]me,
                        pGr[redacted]e,
                        siz[redacted]me)
                        );
                    cha[redacted]me) -
1][redacted]0;

                    Set[redacted]FO,
siz[redacted]o));
                    m_p[redacted]e(
                        pHd[redacted]IP,
                        pHd[redacted]rt,
                        &se[redacted]dr,
                        &ch[redacted]fo,
                        siz[redacted]fo)
                        );
                }
            };
            br[redacted];

        cas[redacted]FO:
            {
                CG[redacted]el);

                if [redacted]d)
                {
                    st[redacted](
                        pGr[redacted]me,
                        pCh[redacted]me,
                        siz[redacted]me)
                        );
                }
            }
            br[redacted];

        cas[redacted]EL:
```

```
        if [redacted]l > 0)
        {
            CGr[redacted]d;
            CPl[redacted]er(
                pHd[redacted]IP,
                pHd[redacted]rt
                );

            if [redacted]L)
            {
                pPl[redacted]r(
                    pHd[redacted]IP,
                    pHd[redacted]rt,
                    pJo[redacted]el
                    );
            }
            els[redacted]l > 0)
            {
                if [redacted]l)) !=
[redacted]L)
                {
                    pGr[redacted]rt);
                }
            }

            pGr[redacted]el);

            if [redacted]LL)
            {
                br[redacted];
            }
            pGr[redacted]r);
            pPl[redacted]el);

            if [redacted]el)
            {
                ret[redacted]rt,
[redacted]e);
            }
        }
        br[redacted];

    cas[redacted]EL:
        if [redacted]l > 0)
        {
            CPl[redacted]er(
                pHd[redacted]IP,
                pHd[redacted]rt
                );
            CGr[redacted]el);

            if ([redacted]LL))
            {
                br[redacted];
            }

            pGr[redacted]rt);
```

```
            pPl[redacted]l(0);

            if [redacted]el)
            {
                AUD[redacted]on(
                    pHd[redacted]P,
                    pHd[redacted]rt
                    );

                if [redacted]L)
                {
                    pCo[redacted]();
                    Inv[redacted]();
                }
            }
        }
        br[redacted];

    cas[redacted]T:
        {
            m_p[redacted]rt);
        }
        br[redacted]k;

    de[redacted]t:
        b[redacted]k;
    }

    re[redacted]t;
}
// END [redacted]ck


/*****************************************************************************
**
* Function:        [redacted]
*
* Description:     Check to see if we can speak in this grid.
*
* Returns:         [redacted]
*
*****************************************************************************
*/
AUD[redacted] [redacted]wed()
{
    Upd[redacted]s();
    if [redacted]d)
    {
        ret[redacted]OR;
    }
    e[redacted]
    {
        ret[redacted]IC;
    }
}
```

```
/*****************************************************************************
**
* Function:        [redacted]
*
* Description:    Update the m_bSpeakAllowed status flag. This function is time
*                dependent.
*
* Returns:      [redacted]
*****************************************************************************
*/
void [redacted]()
{
    RT[redacted]i;

    // Do [redacted]ner?
    for ([redacted]++)
    {
        if ([redacted]ED)
        {
            br[redacted];
        }
    }
    if ([redacted]NS)
    {
        // No [redacted]us.
        m_b[redacted] 0;
    }
    els[redacted] &&
        ((m_C[redacted]P) ||
        (m_C[redacted]) )
    {
        // The[redacted]ing
        if ([redacted])) >
SPE[redacted]ME)
        {
            // Whoe[redacted]pped.
            m_C[redacted] 0;
            m_C[redacted]= 0;
            m_b[redacted] 1;
        }
        e[redacted]
        {
            m_b[redacted] = 0;
        }
    }
    e[redacted]
    {
        // No o[redacted]ing.
        m_b[redacted]d = 1;
    }

    if (!m[redacted]d)
    {
        // Mak[redacted]ce 0.
        m_p[redacted]e();
    }
}
```

```
/*****************************************************************************
**
* Function:
*
* Description:    Send out a greeting message to a specific
*
* Returns:
*****************************************************************************
*/
AUD                              ing
(
    RT_                                                  IP
    RT_                                                   ort
    RT_                                                                    le
)
{
    RT_          i;
    AUD                    dr;
    CLI                   ng;

    gre                                    IP;
    gre                                                rt;
    gre                                               el;
    gre                 = 0;
    gre                              ng);

    for                          i++)
    {
        if (                                        ID))
        {
            gre                  ++;
        }
    }

    if (b                                    0))
    {
        Set                                                  ing));

        ret                          age(
            nD     P,
            nD       t,
            &s         r,
            &g       g,
            si               g)
            );
    }
    e
    {
        ret                OR;
    }
}


/*****************************************************************************
**
```

```
* Function:
*
* Description:    Return pointer to an [redacted] that matches the IP & Port.
*
* Returns:
*****************************************************************************
*/
AUD[redacted]ion
(
    RT_[redacted]P,
    RT_[redacted]t
)
{
    RT_[redacted]i;

    for ([redacted]++)
    {
        if ([redacted]&&
            (m_C[redacted]t) )
        {
            ret[redacted]i]);
        }
    }

    ret[redacted]L;
}


/*****************************************************************************
**
* Function:
*
* Description:    Sends a message that invites connection on ourself.
*
* Returns:
*****************************************************************************
*/
AUD[redacted]t()
{
    AUD[redacted]dr;
    CLI[redacted]ct;

    may[redacted]el;
    may[redacted]IP;
    may[redacted]rt;

    Set[redacted]dr,
        MSG[redacted]CT,
        siz[redacted]t)
        );

    ret[redacted]e(
        m_p[redacted]P,
        m_p[redacted]t,
        &se[redacted]r,
        &ma[redacted]t,
        siz[redacted]t)
```

```
        );
}

voi[redacted]t()
{
    RT_[redacted]i;
    AUD[redacted]dr;
    CLI[redacted]it;

    Set[redacted]it));

    cli[redacted]it);
    cli[redacted]lIP;
    cli[redacted]ort;

    Sen[redacted]e(
        cli[redacted]IP,
        cli[redacted]rt,
        &se[redacted]r,
        &cl[redacted]t,
        siz[redacted]it)
        );

    m_P[redacted]();
    for [redacted]i++)
    {
        m_C[redacted]e();
    }
}

AUD[redacted]yer
(
    ENU[redacted]nc,
    uns[redacted]a
)
{
    RT_[redacted];

    for [redacted]i++)
    {
        if [redacted]ED)
        {
            CPl[redacted]er(
                m_C[redacted]IP,
                m_C[redacted]rt
                );

            if (p[redacted]L)
            {
                CLI[redacted]o;

                cli[redacted].IP;
                cli[redacted]rt;
                cli[redacted]el;
```

```
                if [redacted]fo))
                {
                    b[redacted];
                }
            }
        }
    }

    ret[redacted]OR;
}

voi[redacted]on()
{
    RT_[redacted]i;

    for ([redacted]i++)
    {
        if [redacted]ED)
        {
            m_C[redacted]te();
        }
    }
}

voi[redacted]er
(
    CPl[redacted]er
)
{
    m_P[redacted]er);
}

voi[redacted]er
(
    RT_[redacted]IP,
    RT_[redacted]rt
)
{
    AUD[redacted]rt);

    if [redacted]LL)
    {
        pCo[redacted]e();
        Inv[redacted]t();
    }

    m_P[redacted]rt);
}

voi[redacted]er
(
    CLI[redacted]er
)
```

```
{
    pSp                                    el;
    pSp                                    00;

    if                                     rt)
    {
        if (                                                    e)) >
SP                  ME)
        {
            // Whoe                                                          ped.
            m_C                 = 0;
            m_C                 = 0;
            m_b                 = 1;
        }
    }

    pSp                                    IP;
    pSp                                                        rt;
    if                                     rt)
    {
        CPl                                                    IP,
m_C                 t);
        if      f)
        {
            str                                                            ker-
>c                  e));
        }
    }
}
```

EXHIBIT C

```
/*****************************************************************************
*
* Copyright (c) [redacted] SCEA. All Rights Reserved.
*
* This software contains the valuable trade secrets of SCEA.  The
* software is protected under copyright laws as an unpublished work of
* SCEA.  Notice is for informational purposes only and does not imply
* publication.  The user of this software may make copies of the software
* for use with parts manufactured by SCEA or under license from
* SCEA and for no other use.
*
*****************************************************************************/

/*****************************************************************************
*
*  File Name:       [redacted]
*
*  Description:       Implementation of the CAudio class.
*
*
*  Programmers:     Anthony Mai (am) anthony_mai@playstation.sony.com
*
*  History:         [redacted]
*
*  Notes:           [redacted]
*
*****************************************************************************/

#if [redacted]32)
#in[redacted].h>
#in[redacted].h>
#en[redacted]N32)

#in[redacted].h>
#in[redacted].h"
#in[redacted].h"
#in[redacted].h"
#in[redacted].h"
#in[redacted].h"
#in[redacted].h"
#in[redacted].h"

#in[redacted].h"
#in[redacted].h"
#in[redacted].h"


#de[redacted]24


st[redacted] = 0;

vo[redacted]me()
{
    gTi[redacted]();
}
```

```
RT_[redacted]e()
{
    re[redacted]rt);
}

/*****************************************************************************
* Function:       [redacted]
*
* Description:    Convert IP string like "127.0.0.1" to binary value. For example
*                "127.0.0.1" converts to 0x7f000001.
*
* Returns:        [redacted]
[redacted]
*****************************************************************************/
sta[redacted]IP
(
    RT_[redacted]ng
)
{
    RT_[redacted]=0;
    RT_[redacted]    c;

    if [redacted]g)
    {
        wh[redacted]++)
        {
            if [redacted].')
            {
                ip [redacted]al;
                va[redacted] 0;
            }
            el[redacted]9'))
            {
                va[redacted] [redacted]0');
            }
        }
        ip [redacted]al;
    }

    re[redacted]p;
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Convert a binary IP to IP string. For example 0x7f000001 will
*                be converted to "127.0.0.1".
*
* Returns:        [redacted]
[redacted]
*****************************************************************************/
st[redacted]ng
(
    RT_[redacted]p,
    RT_[redacted]g
)
```

```
{
    RT_[redacted]=0;

    if [redacted]g)
    {
        for [redacted]++)
        {
            i[redacted]0)
            {
                *pIP[redacted].';
            }
            va[redacted]>24;
            if [redacted]00)
            {
                *pIP[redacted]0');
                va[redacted]0;
                go[redacted]t_2;
            }
            e[redacted]= 10)
            {
            d[redacted]2:
                *pI[redacted]0');
                val[redacted]0;
                go[redacted]1;
            }
            e[redacted]
            {
            di[redacted]:
                *pI[redacted]');
            }
            ip [redacted] 8;
        }
        *pI[redacted]00;
    }
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    [redacted] class constructor
*
* Returns:        [redacted]
*****************************************************************************/
CA[redacted]o() :
    m_[redacted]0),
    m_[redacted]0),
    m_[redacted](0),
    m_[redacted](0),
    m_[redacted](0),
    m_[redacted](0),
    m_[redacted](0),
    m_[redacted](0),
    m_[redacted]L),
    m_[redacted]L),
    m_[redacted]L),
    m_[redacted]L),
```

```
    m_[redacted]L),
    m_[redacted]L),
    m_[redacted]L),
    m_[redacted]LL),
    m_[redacted]L),
    m_[redacted](0),
    m_[redacted]L),
    m_[redacted]0),
    m_[redacted](0),
    m_[redacted](0),
    m_[redacted](0),
    m_[redacted](0),
    m_[redacted]s(0),
    m_[redacted](0),
    m_[redacted](0),
    m_[redacted](0)
{
    me[redacted]ks));
}

/*****************************************************************************
* Function:       [redacted]
*
* Description:    [redacted] class destructor
*
* Returns:        [redacted]
*****************************************************************************/
[redacted]
{
    Des[redacted]();
    Des[redacted]();
    Cle[redacted]);
}

/*****************************************************************************
* Function:       [redacted]
*
* Description:    Re-start the audio sequence from zero. This must be done when
*                 we first starts to speak. Or starts speaking after a pause.
*
* Returns:        [redacted]
*****************************************************************************/
voi[redacted]ce()
{
    m_n[redacted] 0;
}

/*****************************************************************************
* Function:       [redacted]
*
* Description:    Return a sequence number for audio data. Note it is different
*                 from the sequence number returned by [redacted].
*
* Returns:        [redacted]
```

```
*****************************************************************************/
RT_[redacted]e()
{
    ret[redacted]+;
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Initialize the [redacted] object. Initialize the GSM codec and
*                 sample rate converter. Initialize the rt_comm layer. We do
*                 NOT check the validity of parameters passed in.
*
* Returns:        [redacted]
*****************************************************************************/
AUD[redacted]ze
(
    int         [redacted]n,
    int         [redacted]In,
    int         [redacted]n,
    int         [redacted],
    int         [redacted]eOut,
    int         [redacted]ut,
    int         t,
    REC[redacted]nc,
    PLA[redacted]unc
)
{
    RT_[redacted]pt;
    RT_[redacted]OK;
    RT_[redacted]6];

    if [redacted]= 0)
    {
        re[redacted]ID;
    }

    Ad[redacted]);

    m_p[redacted]c;
    m_[redacted]nc;

    re[redacted]p();
    if [redacted]et)
    {
        ret[redacted]IC;
    }

    Chn[redacted]UDP;
    Chn[redacted]EN;

    str[redacted]0;
    rt_[redacted]IP);
    m_L[redacted]IP);

    m_L[redacted]rt;
```

```
    ret [redacted]te(
        (voi[redacted]n,
        N[redacted],
            n[redacted],
            &C[redacted]
        );
    if [redacted]t)
    {
        re[redacted]C;
    }

    m_p[redacted]l);
    m_p[redacted]r);

    m_p[redacted]M();
    m_p[redacted]M();

    m_p[redacted]is);

    m_S[redacted]ZED;

    ret[redacted]OR;
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Clean up before the object is destroyed or re-initialized.
*
* Returns:        [redacted]
*****************************************************************************/
voi[redacted]up()
{
    whi[redacted]0)
    {
        de[redacted]ev);
    }

    if [redacted]n)
    {
        rt_c[redacted]nn);
        m_[redacted]L;
    }

    rt_[redacted]n();

    if [redacted]ce)
    {
        de[redacted]ce;
        m_[redacted]L;
    }

    m_S[redacted] 0;
}
```

```
/*****************************************************************************
* Function:        [redacted]
*
* Description:     Return the local IP. The IP may NOT be the same as what
remote
*                machine sees if a network proxy is used. [redacted]
*
* Returns:         [redacted].
*****************************************************************************/
uns[redacted]IP()
{
    re[redacted]IP;
}


/*****************************************************************************
* Function:        [redacted]
*
* Description:     Return the local UDP port used.
*
* Returns:         [redacted]
*****************************************************************************/
uns[redacted]rt()
{
    re[redacted]rt;
}


/*****************************************************************************
* Function:        [redacted]
*
* Description:     Join a game. The client must know at least one remote client's
*                IP and Port to be able to join. That information may be obtained
*                by the application from the game server.
*
* Returns:         [redacted]
*****************************************************************************/
AUD[redacted]in
(
    uns[redacted]IP,
    uns[redacted]rt
)
{
    AUD[redacted]dr;
    CLI[redacted]in;

    if [redacted]= 0)
    {
        ret[redacted]ID;
    }

    m_p[redacted]n));

    cli[redacted]in);
    cli[redacted]IP;
    cli[redacted]rt;
```

```
    m_[redacted]NED;

    ret[redacted]ge(
        ho[redacted],
        ho[redacted]
        &s[redacted]dr,
        &c[redacted],
        si[redacted]n)
        );
}


voi[redacted]t()
{
    if [redacted] > 0)
    {
        Qui[redacted]el);
    }

    if [redacted]d0)
    {
        m_[redacted]t();
    }

    m_[redacted]NED;
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Process any incoming data and send out pending outgoing data.
*                 This function must be called by the application periodically
*                 to do the processing.
*
* Returns:        [redacted]
*****************************************************************************/
AUD[redacted]e()
{
    // Rea[redacted].
    // Proc[redacted]
    // Repe[redacted]
    // forw[redacted]
    AUD[redacted]OR;
    RT_[redacted]P;
    RT_[redacted]0;
    RT_[redacted]96];
    RT_[redacted] 0;
    CGr[redacted]LL;

    for [redacted]fer
    {
        rec[redacted]rt);

        if [redacted] 0)
        {
```

```
            // Er[redacted] it
            ret [redacted]RIC;
            b[redacted];
        }
        if [redacted] 0)
        {
            b[redacted]er.
        }
        // We [redacted]age
        if ([redacted]ff,
[redacted]nt))
        {
            // Err[redacted] it
            ret [redacted]C;
            b[redacted];
        }
    }

    whi[redacted]OR)
    {
        if [redacted](0))
        {
            ret [redacted]te();
        }

        if [redacted]OR)
        {
            b[redacted];
        }

        if [redacted]el)))
        {
            ret [redacted]e();
        }

        b[redacted];
    }

    // Pro[redacted]ta
    if [redacted]ULL)
    {
        re[redacted] 0;
        whi[redacted]ff)))
> 0)
        {
            Str[redacted]t);
            if [redacted]f))
            {
                b[redacted];
            }
        }
    }

    // Pro[redacted]a.
    rec[redacted] 0;
    whi[redacted]))) > 0)
    {
```

```
        Str                                nt);
    }

    re       t;
}


/*****************************************************************************
* Function:
*
* Description:    Create a new audio channel. It fails if the channel name has
*                already been used.
*
* Returns:
*****************************************************************************/
AU                                    el
(
    int                   um,
    con                   me
)
{
    CGr                           d0;
    CPl                     er;
    AUD                       dr;
    CRE                           el;

    if                      ) ||
        (pC                 L) ||
        (*pC                0) )
    {
        ret                       ID;
    }

    *pC            1;
    whi                       um))
    {
        (*pC           ++;
    }

    whi                                                       d0))
    {
        if                                        = 0)
        {
            // The                          .
            ret                       D;
        }
    }

    if                     0)
    {
        Qui                           1);
        m_c              = 0;
    }

    pGr                           m);
    str                                                       e));
    pGr                                           00;
```

```
    pTh                                                          rt);
    pGr                                      r);

    cre                                        el);
    cre                                          l;
    str                                             me,
siz                                      e));
    crea                                                          0;

    m_p                    er(
        &se          r,
        MSG                EL,
        siz                el)
        );

    m_c                                        el;
    pTh                                        el);

    // We                        w.
    re                        ge(
        m_       P,
        m_        rt,
        &s        dr,
        &c           el,
        si                 el)
        );
}


/*****************************************************************************
* Function:
*
* Description:    Process an incoming package. It could be a control package or
*                audio data package.
*
* Returns:
*****************************************************************************/
AUD                                    ge
(
    RT_                        P,
    RT_                         rt,
    RT_                        er,
    RT_                        ze
)
{
    AUD                   ck;
    CG                       L;
    in                   ex;

    // San                          e.
    if (                      k))
    {
        re                    IC;
    }

    me                                    ck));
```

```
if [redacted]OR)
{
    // Beca[redacted]nt.
    th[redacted]mIP;
    th[redacted]ort;
    th[redacted]OR;
    me[redacted]ck));
}

swi[redacted]e)
{
ca[redacted]CM:
ca[redacted]SM:
ca[redacted]10:
    // We i[redacted]s.
    if [redacted]
[redacted]E))))
    {
        ret[redacted]C;
    }
    b[redacted];
de[redacted]:
    if [redacted]k)))
    {
        ret[redacted]IC;
    }
    b[redacted];
}

// Is t[redacted]f?
if [redacted]t))
{
    ret[redacted]OR;
}

pGr[redacted]l);
if [redacted]L)
{
    // This [redacted] to.
    ret[redacted]IC;
}

// Is [redacted]ge?
iIn[redacted]k;
whi[redacted]ck)
{
    if [redacted]ce)
    {
        co[redacted];
    }
    if [redacted]IP)
    {
        co[redacted];
    }
    if [redacted]rt)
    {
```

```
            co[redacted];
        }
        if [redacted]e)
        {
            co[redacted];
        }
        if [redacted]el)
        {
            co[redacted];
        }
        if [redacted]th)
        {
            co[redacted];
        }
        // Th[redacted]
        ret[redacted]OR;
    }
    m_p[redacted]ck;
    m_i[redacted]-1);

    if [redacted] &&
        (th[redacted]M) )
    {
        ret[redacted]
ze);
    }
    e[redacted]
    {
        ret[redacted]
ze);
    }
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Send a package to a specific UDP address.
*
* Returns:        [redacted].
*****************************************************************************/
AU[redacted]ge
(
    RT_[redacted]IP,
    RT_[redacted]rt,
    AUD[redacted]dr,
    con[redacted]er,
    RT_[redacted]ze
)
{
    RT_[redacted]ze;
    RT_[redacted]ZE];

    mem[redacted]));
    nSi[redacted]r);

    mem[redacted]ze);
```

```
    nSi[redacted]e;

    if [redacted]rt))
    {
        ret[redacted]OR;
    }
    e[redacted]
    {
        ret[redacted]C;
    }
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Send a chunk of data by UDP to a remote address.
*
* Returns:        [redacted]
*****************************************************************************/
in[redacted]To
(
    con[redacted]er,
    RT_[redacted]ze,
    RT_[redacted]IP,
    RT_[redacted]rt
)
{
    RT_[redacted]lt;
    RT_[redacted] 0;
    RT_[redacted]6];

    IP[redacted]dr);

      res[redacted]o(
            (v[redacted]n,
            t[redacted],
            (RT[redacted]t,
            pB[redacted]r,
            (RT[redacted]e,
            &[redacted]nt
        );

    if [redacted]OK)
    {
        // Dea[redacted]
        ret[redacted]C;
    }

    ret[redacted]nt;
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Receive any incoming data on the UDP port.
```

```
*
* Returns:
[redacted]
*****************************************************************************/
int[redacted]om
(
    RT_[redacted]er,
    RT_[redacted]ze,
    RT_[redacted]IP,
    RT_[redacted]rt
)
{
    RT_[redacted]t;
    uns[redacted] 0;
    cha[redacted][32];

    *pR[redacted] 0;
    *pR[redacted] 0;

    re[redacted]om(
            (voi[redacted]n,
            fr[redacted]r,
            (RT[redacted]t,
            pB[redacted],
            (RT[redacted]e,
            &r[redacted]t
        );

    if [redacted]OK)
    {
        // Deal [redacted]
        ret[redacted]C;
    }
    el[redacted] 0)
    {
        *pRe[redacted]r);
    }

    re[redacted]t;
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Add a new grid which is associate with a specific channel.
*
* Returns:        [redacted]
*****************************************************************************/
[redacted]
(
    int [redacted]l
)
{
    CG[redacted]el);

    if [redacted]0)
```

```
    {
        pGr                    0;
        pGr                          ev;
        pGr                        id;
        pGr                        id;
    }
    e
    {
        pGr                id;
        pGr                id;
        m_p              d;
    }

    re          ;
}


/*****************************************************************************
* Function:
*
* Description:    Find a grid associated with a specific channel number.
*
* Returns:
*****************************************************************************/

(
    int        l
)
{
    CGr                    0;
    whi        d)
    {
        if                          el)
        {
            b     ;
        }
        e
        {
            pGr                t;
            if                 0)
            {
                pG          L;
                b     ;
            }
        }
    }
    ret        d;
}


/*****************************************************************************
* Function:
*
* Description:    Remove a grid from the linked list. Caller needs to make sure
*                 it is in the linked list since we don't check. Note we do not
*                 call delete so the caller needs to do the delete.
*
```

```
* Returns:
*****************************************************************************/
(
    CG          id
)
{
    if      d)
    {
        if          d0)
        {
            m_          LL;
        }
        else
        {
            pGr                                 xt;
            pGr                                 ev;
        }
    }

    ret         d;
}


/*****************************************************************************
* Function:
*
* Description:    Cleanup the sample rate converter.
*
* Returns:
*****************************************************************************/
voi                             s()
{
    if          n)
    {
        del             In;
        m_p             LL;
    }
    if          t)
    {
        del             ut;
        m_p             LL;
    }
}


/*****************************************************************************
* Function:
*
* Description:    Clean up the GSM codec.
*
* Returns:
*****************************************************************************/
voi                             s()
{
    if          n)
    {
```

```
        del[redacted]n;
        m_[redacted]L;
    }
    if [redacted]t)
    {
        del[redacted]t;
        m_p[redacted]L;
    }
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    The audio stream output function. The [redacted] calls this function
*                 when it has received compressed audio data from the network, and
*                 has sequenced the data properly. We do decoding within this
*                 and the decoded data is directly sent to the PLAYFUNC provided
*                 by the application.
*
* Returns:        [redacted]
*****************************************************************************/
int [redacted]put
(
    RT_[redacted]er,
    RT_[redacted]ze
)
{
    RT_[redacted]nk;
    gsm[redacted]0];

    whi[redacted] 0)
    {
        if [redacted] 0)
        {
            one[redacted]ze;
            if [redacted]ze)
            {
                me[redacted]ze);
                m_[redacted]ze;
                b[redacted];
            }
            e[redacted]e
            {
                me[redacted]nk);
                pB[redacted]nk;
                cb[redacted]nk;
                St[redacted]);
                m_[redacted]ta);
                m_[redacted]e();
                m_[redacted]ZE;
                if [redacted]y)
                {
                    m_[redacted]ZE);
                }
                nD[redacted]ZE;
                m_[redacted]E;
```

```
            }
        }
        el[redacted]ZE)
        {
            me[redacted]ze);
            m_[redacted]e;
            b[redacted];
        }
        e[redacted]
        {
            St[redacted]();
            m_[redacted]ta);
            m_[redacted]e();
            m_[redacted]IZE;
            if [redacted]y)
            {
                m_[redacted]ZE);
            }
            pB[redacted]ZE;
            cb[redacted]ZE;
            nD[redacted]ZE;
        }
    }

    re[redacted]ed;
}


/*****************************************************************************
* Function:     [redacted]
*
* Description:    Audio stream input function. Application calls this function
*               periodically when it has audio data available (from Microphone).
*               Flow control (make sure we stream the right amount of data in
*               the right amount of time) is done by the caller. Input size 0
*               has special meanings: It signify the end of streaming input.
*
* Returns:      [redacted]
*****************************************************************************/
int [redacted]ut
(
    RT_[redacted]er,
    RT_[redacted]ze
)
{
    RT_[redacted]nk;
    RT_[redacted]2];
    CGr[redacted]d();
    AUD[redacted]dr;

    if [redacted]LL)
    {
        ret[redacted]ed;
    }

    aud[redacted]SM;
    aud[redacted]IP;
```

```
aud[redacted]rt;
aud[redacted]el;

if [redacted] 0)
{
    au[redacted]e();
    au[redacted] = 0;
    pS[redacted]ge(
        m_[redacted]P,
        m_[redacted]t,
        &a[redacted]r,
        gs[redacted]a,
        au[redacted]th
        );

    Res[redacted]e();
}
el[redacted] > 0)
{
    if [redacted] > 0)
    {
        on[redacted]ize;
        if [redacted]ze)
        {
            mem[redacted]ze);
            m_I[redacted]e;
            b[redacted];
        }
        e[redacted]
        {
            mem[redacted]nk);
            pBu[redacted]nk;
            cbS[redacted]nk;
            m_I[redacted]nk;

            St[redacted]e();
            m_[redacted]ta);
            m_p[redacted]ZE]),
&(g[redacted]ZE]));
            m_n[redacted]me();
            m_n[redacted]ZE*2;

            // Sen[redacted]id
            aud[redacted]ce();
            aud[redacted]*2;
            pSp[redacted]e(
                m_[redacted]P,
                m_[redacted]rt,
                &a[redacted]r,
                gs[redacted]a,
                au[redacted]th
                );

            nEn[redacted]*2;
            m_I[redacted]*2;
        }
    }
```

```
        el                                  *2))
        {
            mem                             ze);
            m_I                 ze;
            b
        }
        e
        {
            St          ();
            m_p                                         a);
            m_p
                        IZE]));
            m_n                             me();
            m_n                             *2;

            // Send                         id
            aud                                         ce();
            aud                             *2;
            pSp                     ge(
                m_          P,
                m_          rt,
                &a          r,
                gs      a,
                au                  th
                );

            pBu                     *2;
            cbS                     *2;
            nEn                     *2;
        }
    }

    ret             d;
}


/*****************************************************************************
* Function:
*
* Description:    Return pointer to the audio grid we are currently allowed to
*                speak.
* Returns:
*****************************************************************************/

{
    CGr                 L;
    if                      0)
    {
        if                                              L)
        {
            if (                        d())
            {
                pGr             L;
            }
            e
            {
                //OK,                       .
```

```
            }
        }
    }

    ret[redacted];
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Join a channel by the channel number. The channel number must
*                 be none-zero.
*
* Returns:        [redacted]
*****************************************************************************/
[redacted]
(
    int [redacted]l
)
{
    AUD[redacted]OR;
    AUD[redacted]dr;
    CLI[redacted]el;

    if [redacted] 0)
    {
        Qu[redacted]el);
    }
    if ([redacted] 0)
    {
        CGr[redacted]l);

        joi[redacted]el;
        joi[redacted]IP;
        joi[redacted]rt;

        m_[redacted]r(
            &s[redacted]r,
            MS[redacted]NEL,
            si[redacted]el)
            );

        ret [redacted]e(
            m_[redacted]P,
            m_[redacted]rt,
            &s[redacted]r,
            &jo[redacted]el,
            si[redacted]el)
            );

        if [redacted]OR)
        {
            CP[redacted]
[redacted]ort);
```

```
            m_c[redacted]nel;

            pTh[redacted]el);

            if ([redacted]LL)
            {
                pG[redacted]er);
            }

            m_S[redacted]NEL;
        }
    }

    re[redacted]t;
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Quit a specific channel by channel number. We check to be sure
*                 we are currently in the channel before sending the quit message
*                 out. The channel number must be none-zero.
*
* Returns:        [redacted]
[redacted]
*****************************************************************************/
AUD[redacted]el
(
    in[redacted]el
)
{
    AUD[redacted]OR;
    AUD[redacted]dr;
    CLI[redacted]el;
    CGr[redacted]id;

    if [redacted] 0) ||
        (nC[redacted]el) )
    {
        re[redacted]IC;
    }

    qui[redacted]el;
    qui[redacted]IP;
    qui[redacted]rt;

    m_p[redacted]er(
        &se[redacted]r,
        MS[redacted]EL,
        si[redacted]l)
        );

    re[redacted]ge(
        m_[redacted]P,
        m_[redacted]ort,
        &s[redacted]r,
```

```
        &q[redacted]el,
        si[redacted]nel)
        );

    if [redacted]OR)
    {
        pGr[redacted]el);
        if [redacted]LL)
        {
            pGr[redacted]t);
            pGr[redacted]on();
        }
        m_c[redacted] = 0;
        m_p[redacted]el);

        m_S[redacted]EL;
    }

    re[redacted]t;
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Enumerate all existing channels, not just those we are in. The
*                 enumeration continues until all channels have run through, or
*                 the enumeration function returns zero.
*
* Returns:        [redacted]
*****************************************************************************/
[redacted]
(
    ENU[redacted]ion
    uns[redacted]ion.
)
{
    CGr[redacted]d0;

    if [redacted]L)
    {
        ret[redacted]IC;
    }

    whi[redacted]LL)
    {
        CH[redacted]fo;

        cha[redacted]el;
        str[redacted]e,
si[redacted]me));
        cha[redacted]d-
>m[redacted]nt();

        if [redacted]fo))
        {
            b[redacted]
```

```
        }

        pGr[redacted]xt;
        if [redacted]d0)
        {
            pGr[redacted]LL;
        }
    }

    ret[redacted]OR;
}


/*****************************************************************************
* Function:      [redacted]
*
* Description:    Enumerate all existing players (in channel 0). The enumeration
*                continues until all players have run through, or the enumeration
*                function returns zero.
*
* Returns:       [redacted]
*****************************************************************************/
[redacted]
(
    ENU[redacted]ion
    uns[redacted]ion.
)
{
    CPl[redacted]LL;
    CPl[redacted]LL;

    if [redacted]LL))
    {
        ret[redacted]C;
    }

    pPl[redacted]er();

    whi[redacted]LL)
    {
        CLI[redacted]fo;

        cli[redacted]_IP;
        cli[redacted]rt;
        str[redacted]e(),
si[redacted]me));
        cli[redacted]el;

        if [redacted]fo))
        {
            b[redacted];
        }

        pPl[redacted]t;
        if [redacted]r0)
        {
            pP[redacted];
```

```
        }
    }

    re                  OR;
}


/*****************************************************************************
* Function:
*
* Description:    Enumerate all existing players in a specific channel. Enumeration
*                 continues until all players have run through, or the enumeration
*                 function returns zero.
*
* Returns:
*****************************************************************************/

(
    ENU                                                                  ion
    uns                                                                    ion.
    int                                                                  ted.
)
{
    CGr                                  el);
    CPl                    LL;
    CPl                     LL;
    CPl                          LL;

    if                                    LL))
    {
        ret                      IC;
    }

    pRe                                      ef();

    whi                LL)
    {
        CLI                    fo;

        pPl                      er;
        cli                                  _IP;
        cli                                                  rt;
        strncpy(clientInfo.clientName, pPlayer->GetName(),
siz                          me));
        cli                                                  el;

        if                                    fo))
        {
            b    ;
        }

        pRe              t;
        if               f0)
        {
            pR          L;
        }
    }
```

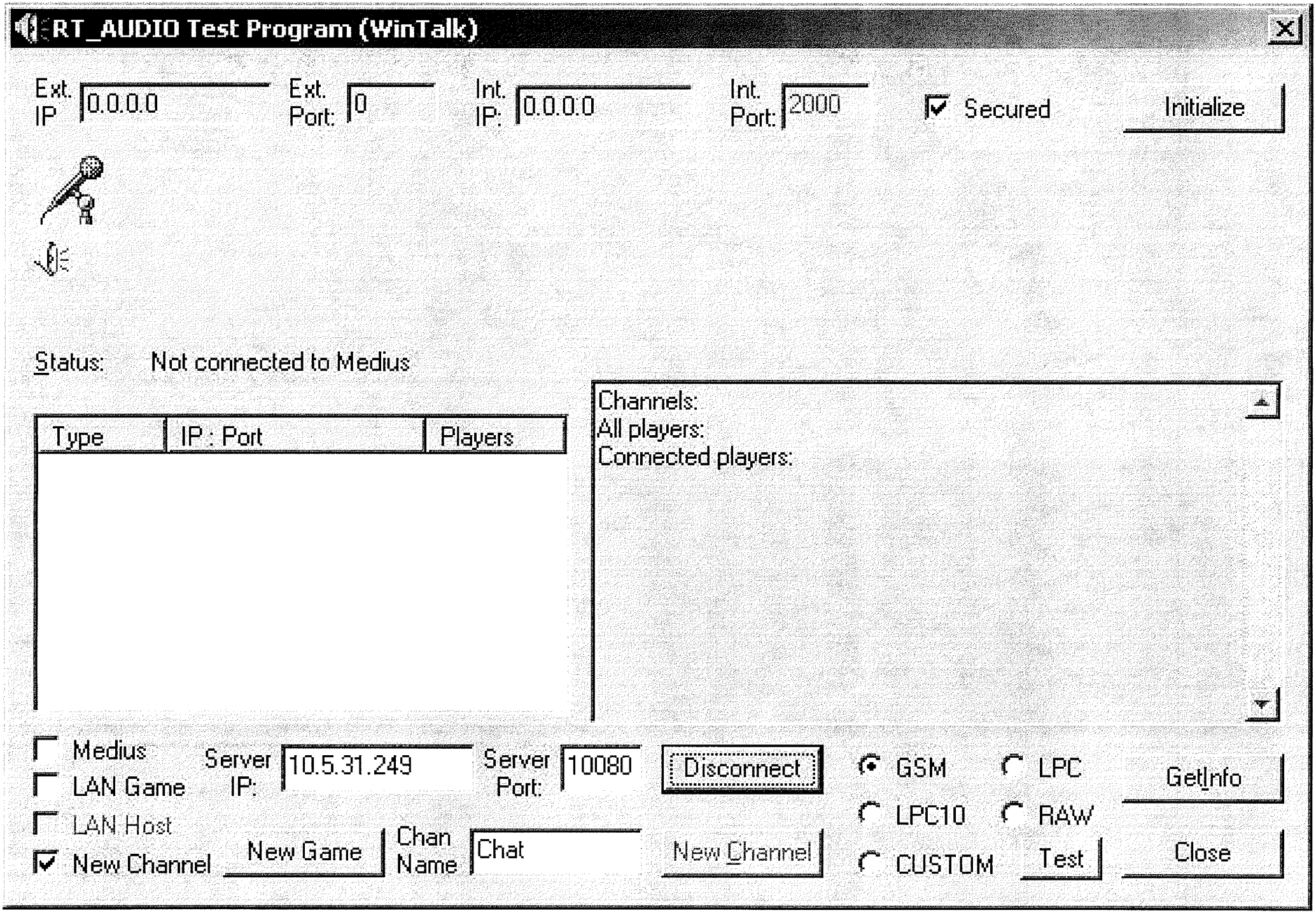
```
    ret[redacted]OR;
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Enumerate all players in a specific channel that we directly
*                 connect with. Enumeration continues until all players have run
*                 through, or the enumeration function returns 0.
*
* Returns:        [redacted]
*****************************************************************************/
[redacted]
(
    ENU[redacted]ion
    uns[redacted]ion.
    int[redacted]ated.
)
{
    CGr[redacted]el);

    if [redacted]LL))
    {
        ret[redacted]IC;
    }
    e[redacted]
    {
        ret[redacted]ta);
    }
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Create and add a new CPlayer object.
*
* Returns:        [redacted]
*****************************************************************************/
[redacted]
(
    RT_[redacted]IP,
    RT_[redacted]rt,
    RT_[redacted]el
)
{
    ret[redacted]el);
}


/*****************************************************************************
* Function:       [redacted]
*
* Description:    Remove and delete an existing [redacted] object associated with a
*                 specific player.
```

```
*
* Returns:
*****************************************************************************/
vo                          er
(
    RT_U                          rt
)
{
    CPl                                                       rt);

    if          r)
    {
        if                          > 0)
        {
            CGr                                               el);
            if      d)
            {
                pGr                           t);
            }
        }
        if          d0)
        {
            m_                                rt);
        }

        m_P                                   rt);
    }
}


/*****************************************************************************
* Function:
*
* Description:    Update and returns the status flag. If a remote client is
*                speaking, the remote client info is returned using         .
*
* Returns:
*****************************************************************************/
                                  (
    CLI                   er
)
{
    CGr             0;

    if                        > 0)
    {
        pGr                                 el);
    }

    if                    er)
    {
        pGr                           er);
    }
    e
    {
        pSp                                 00;
```

```
        pSp                    0;
        pSp                    0;
        pSp                    0;
    }

    if                  id())
    {
        m_S                        LED;
    }
    e
    {
        m_S                            ED;
    }

    re          us;
}


/*****************************************************************************
* Function:
*
* Description:    Re-initialize the    decoder when the source of streaming
*                audio changes.
*
* Returns:
*****************************************************************************/
voi
{
    if          ut)
    {
        m_          it();
    }
}


/*****************************************************************************
* Function:
*
* Description:    Return accumulative average CPU load % for encoding & decoding
*
* Returns:
*****************************************************************************/
vo                  oad
(
    dou          de,
    dou          de
)
{
    if                es)
    {
        *pE                                                                tes;
    }
    e
    {
        *pEn     = 0;
    }
    if                es)
```

```
    {
        *pDe[redacted]tes;
    }
    e[redacted]
    {
        *pD[redacted] 0;
    }
}
```

EXHIBIT D


RT_AUDIO Test Program (WinTalk)
Ext. IP
0.0.0.0
Ext. Port:
0
Int. IP:
0.0.0.0
Int. Port:
2000
Secured
Initialize
Status:
Not connected to Medius
Type
IP : Port
Players
Channels:
All players:
Connected players:
Medius
LAN Game
LAN Host
New Channel
Server IP:
10.5.31.249
Server Port:
10080
Disconnect
New Game
Chan Name
Chat
New Channel
GSM
LPC
LPC10
RAW
CUSTOM
Test
GetInfo
Close

RT_AUDIO Test Program (WinTalk)

My Port: Initialize

Server IP: Server Port: Join

Status:

Test

GetInfo

Chan Name New Channel Join Channel GSM LPC10 RAW

Close

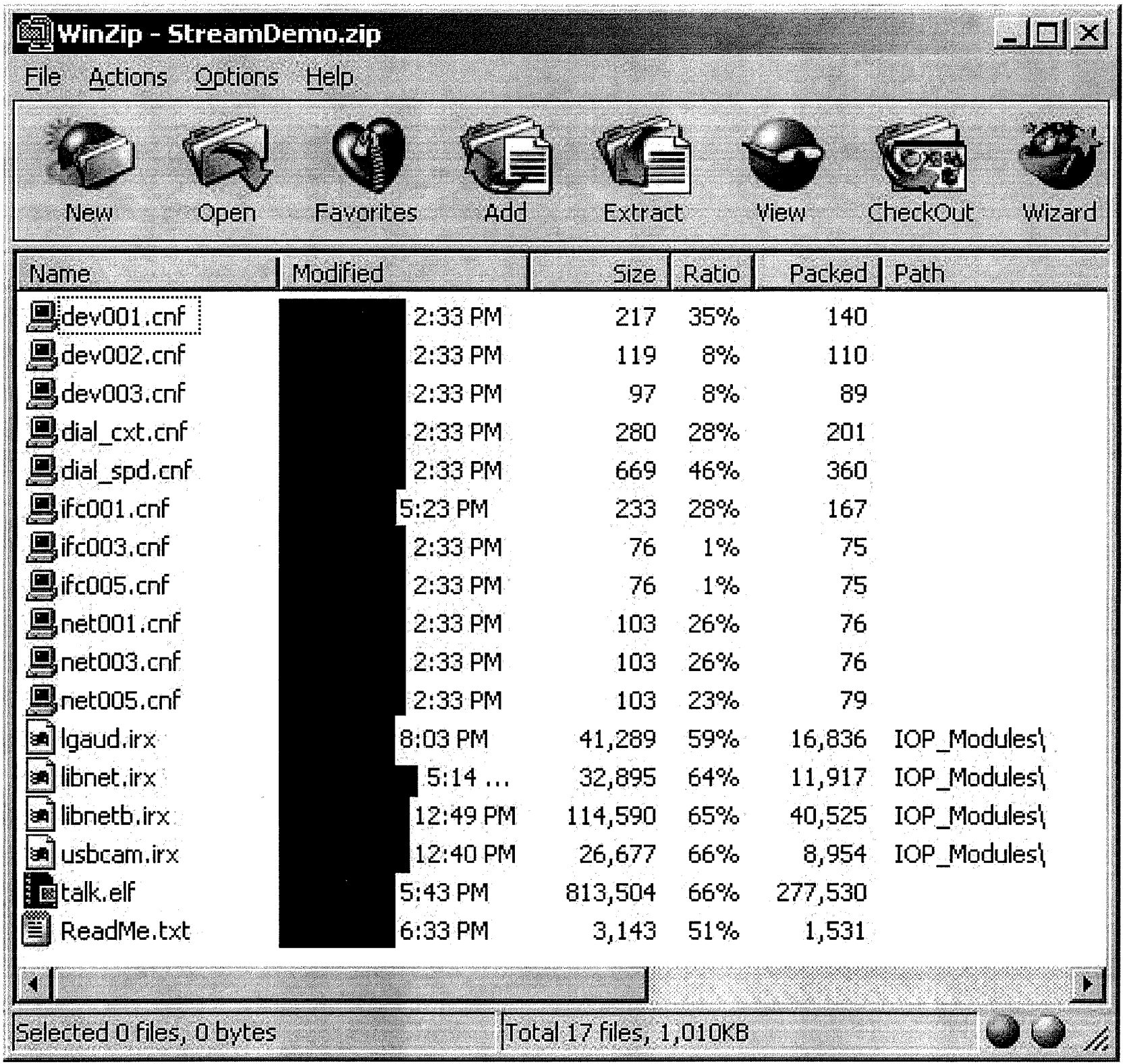

WinZip - StreamDemo.zip
File Actions Options Help
New Open Favorites Add Extract View CheckOut Wizard
Name Modified Size Ratio Packed Path
dev001.cnf 2:33 PM 217 35% 140
dev002.cnf 2:33 PM 119 8% 110
dev003.cnf 2:33 PM 97 8% 89
dial_cxt.cnf 2:33 PM 280 28% 201
dial_spd.cnf 2:33 PM 669 46% 360
ifc001.cnf 5:23 PM 233 28% 167
ifc003.cnf 2:33 PM 76 1% 75
ifc005.cnf 2:33 PM 76 1% 75
net001.cnf 2:33 PM 103 26% 76
net003.cnf 2:33 PM 103 26% 76
net005.cnf 2:33 PM 103 23% 79
lgaud.irx 8:03 PM 41,289 59% 16,836 IOP_Modules\
libnet.irx 5:14 ... 32,895 64% 11,917 IOP_Modules\
libnetb.irx 12:49 PM 114,590 65% 40,525 IOP_Modules\
usbcam.irx 12:40 PM 26,677 66% 8,954 IOP_Modules\
talk.elf 5:43 PM 813,504 66% 277,530
ReadMe.txt 6:33 PM 3,143 51% 1,531
Selected 0 files, 0 bytes
Total 17 files, 1,010KB

EXHIBIT C1-C8

Exhibit C1

```
/*****************************************************************************
**
* Function:       [redacted]
*
* Description:    Create a new audio channel. It fails if the channel name has
*                 already been used.
*
* Returns:        [redacted]
*****************************************************************************
*/
AU[redacted]el
(
    int[redacted]um,
    con[redacted]me
)
{
    CGr[redacted]d0;
    CPl[redacted]er;
    AUD[redacted]dr;
    CRE[redacted]el;

    if [redacted]) ||
        (pC[redacted]L) ||
        (*pC[redacted]0) )
    {
        ret[redacted]ID;
    }

    *pC[redacted] 1;
    whi[redacted]um))
    {
        (*pC[redacted] ++;
    }

    whi[redacted]d0))
    {
        if [redacted]= 0)
        {
            // The [redacted].
            ret[redacted]D;
        }
    }

    if [redacted] 0)
    {
        Qui[redacted]l);
        m_c[redacted] = 0;
    }

    pGr[redacted]m);
    str[redacted]e));
    pGr[redacted]00;

    pTh[redacted]rt);
    pGr[redacted]r);

    cre[redacted]el);
```

```
    cre[redacted]l;
    str[redacted]me,
siz[redacted]e));
    crea[redacted]0;

    m_p[redacted]er(
        &se[redacted]r,
        MSG[redacted]EL,
        siz[redacted]el)
        );

    m_c[redacted]el;
    pTh[redacted]el);

    // We [redacted]w.
    re[redacted]ge(
        m_[redacted]P,
        m_[redacted]rt,
        &s[redacted]dr,
        &c[redacted]el,
        si[redacted]el)
        );
}
```

Exhibit C2

```
/*****************************************************************************
**
* Function:        [redacted]
*
* Description:     Process an incoming package. It could be a control package or
*                  audio data package.
*
* Returns:         [redacted]
*****************************************************************************
*/
AUD[redacted]ge
(
    RT_[redacted]P,
    RT_[redacted]rt,
    RT_[redacted]er,
    RT_[redacted]ze
)
{
    AUD[redacted]ck;
    CG[redacted]L;
    in[redacted]ex;

    // San[redacted]e.
    if ([redacted]k))
    {
        re[redacted]IC;
    }

    me[redacted]ck));

    if [redacted]OR)
    {
        // Beca[redacted]nt.
        th[redacted]mIP;
        th[redacted]ort;
        th[redacted]OR;
        me[redacted]ck));
    }

    swi[redacted]e)
    {
    ca[redacted]CM:
    ca[redacted]SM:
    ca[redacted]10:
        // We i[redacted]s.
        if [redacted]
[redacted]E))))
        {
            ret[redacted]C;
        }
        b[redacted];
    de[redacted]:
        if [redacted]k)))
        {
            ret[redacted]IC;
        }
        b[redacted];
```

```
    }

    // Is t                                        f?
    if
           t))
    {
        ret          OR;
    }

    pGr                                        l);
    if           L)
    {
        // This                                          to.
        ret                IC;
    }

    // Is                ge?
    iIn          k;
    whi                                              ck)
    {
        if                                           ce)
        {
            co       ;
        }
        if                                       IP)
        {
            co       ;
        }
        if                                           rt)
        {
            co       ;
        }
        if                                   e)
        {
            co       ;
        }
        if                                       el)
        {
            co       ;
        }
        if                                   th)
        {
            co       ;
        }
        // Th
        ret          OR;
    }
    m_p                ck;
    m_i                          -1);

    if                 &&
        (th                                                  M) )
    {
        ret
    ze);
    }
    e
```

```
    {
        ret[redacted]
[redacted]ze);
    }
}
```

```
/*****************************************************************************
* Function:        [redacted]
*
* Description:     Enumerate all existing channels, not just those we are in. The
*                 enumeration continues until all channels have run through, or
*                 the enumeration function returns zero.
*
* Returns:         [redacted]
*****************************************************************************/
[redacted]
(
    ENU[redacted]ion
    uns[redacted]ion.
)
{
    CGr[redacted]d0;

    if [redacted]L)
    {
        ret[redacted]IC;
    }

    whi[redacted]LL)
    {
        CH[redacted]fo;

        cha[redacted]el;
        str[redacted]e,
si[redacted]me));
        cha[redacted]d-
>m[redacted]nt();

        if [redacted]fo))
        {
            b[redacted]
        }

        pGr[redacted]xt;
        if [redacted]d0)
        {
            pGr[redacted]LL;
        }
    }

    ret[redacted]OR;
}
```

```
/*****************************************************************************
* Function:
*
* Description:    Enumerate all existing players (in channel 0). The enumeration
*                continues until all players have run through, or the enumeration
*                function returns zero.
*
* Returns:
*****************************************************************************/
(
    ENU                                                                    ion
    uns                                                                    ion.
)
{
    CPl                    LL;
    CPl                    LL;

    if                                        LL))
    {
        ret                C;
    }

    pPl                                                er();

    whi                LL)
    {
        CLI                fo;

        cli                    _IP;
        cli                                            rt;
        str                                            e(),
si                         me));
        cli                                                    el;

        if                                fo))
        {
            b    ;
        }

        pPl                t;
        if                 r0)
        {
            pP             ;
        }
    }

    re                 OR;
```

```
/*****************************************************************************
* Function:       [redacted]
*
* Description:    Enumerate all existing players in a specific channel. Enumeration
*                 continues until all players have run through, or the enumeration
*                 function returns zero.
*
* Returns:        [redacted]
*****************************************************************************/
[redacted]
(
    ENU[redacted]ion
    uns[redacted]ion.
    int [redacted]ted.
)
{
    CGr[redacted]el);
    CPl[redacted]LL;
    CPl[redacted]LL;
    CPl[redacted]LL;

    if [redacted]LL))
    {
        ret[redacted]IC;
    }

    pRe[redacted]ef();

    whi[redacted]LL)
    {
        CLI[redacted]fo;

        pPl[redacted]er;
        cli[redacted]_IP;
        cli[redacted]rt;
        strncpy(clientInfo.clientName, pPlayer->GetName(),
siz[redacted]me));
        cli[redacted]el;

        if [redacted]fo))
        {
            b[redacted];
        }

        pRe[redacted]t;
        if [redacted]f0)
        {
            pR[redacted]L;
        }
    }

    ret[redacted]OR;
}
```

```
/*****************************************************************************
* Function:       [redacted]
*
* Description:    Enumerate all players in a specific channel that we directly
*                 connect with. Enumeration continues until all players have run
*                 through, or the enumeration function returns 0.
*
* Returns:        [redacted]
*****************************************************************************/
[redacted]
(
    ENU[redacted]ion
    uns[redacted]ion.
    int[redacted]ated.
)
{
    CGr[redacted]el);

    if [redacted]LL))
    {
        ret[redacted]IC;
    }
    e[redacted]
    {
        ret[redacted]ta);
    }
}
```

```
/*****************************************************************************
* Function:
*
* Description:    Join a channel by the channel number. The channel number must
*                 be none-zero.
*
* Returns:
*****************************************************************************/
(
    int l
)
{
    AUD                                    OR;
    AUD                        dr;
    CLI                                el;

    if                          0)
    {
        Qu                             el);
    }
    if (            0)
    {
        CGr                                l);

        joi                            el;
        joi                            IP;
        joi                                                rt;

        m_                         r(
            &s       r,
            MS                         NEL,
            si                  el)
            );

        ret                            e(
            m_       P,
            m_         rt,
            &s       r,
            &jo         el,
            si                    el)
            );

        if                         OR)
        {
            CP
ort);

            m_c                        nel;

            pTh                                el);

            if (            LL)
            {
                pG                                     er);
            }
```

```
            m_S[redacted]NEL;
        }
    }

    re[redacted]t;
}
```

Exhibit C8

```
/*****************************************************************************
* Function:        [redacted]
*
* Description:     Create and add a new CPlayer object.
*
* Returns:         [redacted]
*****************************************************************************/
[redacted]
(
    RT_[redacted]IP,
    RT_[redacted]rt,
    RT_[redacted]el
)
{
    ret[redacted]el);
}
```